

Discussion and Interpretation
for the
California Department of Rehabilitation
Specifications for Adaptive Driving Equipment
Revision 2013

August 10, 2013

The purpose for this document is to assist Fleet Administration Inspectors and Department of Rehabilitation designated inspectors in applying the 2013 Specifications for Adaptive Driving Equipment (SADE) in inspecting vehicles for the California Department of Rehabilitation. It is also provided as an aid to Driving Evaluators and Vehicle Modifiers in understanding parts of the SADE and knows what to recommend or bid. The items being discussed are presented in alphabetical order by topic to facilitate its use. The 2013 SADE (in addition to updating information) further improves our response to Federal Motor Vehicle Safety Standards (FMVSS) which affect our vehicle modifications. These Federal Standards are briefly discussed in Appendix 1. A result of having to meet these standards is the need for vehicle modifiers to be able to demonstrate a path to compliance with these new standards. Appendix 2 discusses the concept of a path to compliance. The 2013 SADE also updates our response to the changes in the full size van modifications within the adaptive equipment industry.

The following are some modifications which must be dealt with by inspectors, and others, which may cause questions. Some of these are items which require "acceptance for purchase" (in which case, the "accepted" items are listed). In other cases, the items listed are those which may cause the Inspector to request the vehicle modifier to produce a "path to compliance". The applicable FMVSS (if any) is listed right after the modification. The relevant section of the SADE is listed next.

Carpeting (FMVSS 302) – SADE 4.5.3, 5.2.1 Vehicle modifiers must demonstrate the path to compliance for the carpeting they or their subcontractors use on Department of Rehabilitation modifications.

Custom Fabricated Hand Controls (no FMVSS) – SADE 9.4.2 Acceptance for purchase is required. If custom fabricated hand controls are being inspected they should have been specified in the evaluation reports recommended modifications and the Rehabilitation Engineer should have contacted the vehicle modifier prior to the product being bid for the consumer.

Door latches (FMVSS 206, if an alarm is not used) – SADE 4.2.5 If the OEM door latch has been modified and there is a lift in the doorway, the lift must be linked to an alarm consisting of a flashing visible signal or an audible alarm. If there is no lift blocking the doorway, and OEM door latch has been removed, the vehicle modifiers must demonstrate the path to compliance for the new door latch system.

Floor Lowering of 2004 or later Ford Vans (E250 and E350 Only) – SADE 5.3.1
NorCal Mobility - Accepted per SADE for 4.5” and 6” through 8” floors,
Vantage Mobility International (VMI) 6” floor,

Floor Lowering of 2007 and later Ford Vans E-150 – SADE 5.3.1

NorCal Mobility - Accepted per SADE for 4.5”, 6” and 8” floors.

Other manufacturers who are known to supply lowered floor, full size vans, in California are Mobility Works (at Mobility Works/Advanced Mobility in Van Nuys). At this time, this manufacturer’s modifications have not submitted data nor been accepted for purchase.

Fuel Systems (FMVSS 301) – SADE 5.3.8 Acceptance for purchase is required. The following fuel systems have been tested to comply with FMVSS 301 and with additional requirements in older revisions of the SADE.

Transfer Flow

- Tanks manufactured by Transfer Flow for 2004 through 2006 Ford E250 and E350.

VMI Liberty (Ford Econoline) Van.

- Post-2005 – Accepted for purchase per SADE. 2006 VMI vans are now built by Tuscany, which has been approved for purchase.

Headrests (no FMVSS) – SADE 8.7 Acceptance for purchase required. At this time, no headrests which are attached to the vehicle comply with the SADE.

Ignition/Starter Switches (no FMVSS) – SADE 10.11.2 The ignition switch must be coded or otherwise designed to prevent theft of the vehicle unless waived as being otherwise difficult to steal.

Waived

Driving Systems Inc. (DSI) – A thief would not get more than a couple of blocks without training.

Coded

EMC

Crescent (can be coded, must be specified in the evaluation)

Insulation and Paneling (FMVSS 302) – SADE 4.9.2 Vehicle modifiers must demonstrate the path to compliance for the insulation and paneling they or their subcontractors use on Department of Rehabilitation modifications.

Manual Hand Controls (no FMVSS) – (SAE or VA) – SADE 9.4.1 We have received documentation that the following hand controls have been tested to comply with SAE or VA standards and we have also determined that they comply with the Specifications for Adaptive Driving Equipment. At the time this was written, Guido Simplex had not yet been accepted for purchase.

- Drive Master
- Menox (MCH-1, MCH-5 and MCH-8)
- MPD (3500, 3502 and 3700)
- MPS Monarch
- Suregrip SG1
- Wells Engberg (MC-25, MC-50, CT100 and CP200)

Minivans (no specific FMVSS) – SADE 6.2 Acceptance for purchase required. The following minivans have been accepted for purchase. (Note: ADA denotes raised doorway at entrance)

Side entry minivans

- Chevrolet Uplander (Buick Terazza) – Accepted for purchase, Braun (2006-2008 accepted) must have optional full length “tubing and hose shield” under floor area of van.

Chrysler Corp. minivans:

- IMS (pre '96, '96 to 2000, 2001-2006 accepted) (2001+ includes ADA).

- VMI (pre '96, '96 to 2000, 2001 and later accepted) (not ADA, but including Stow and Go Seats).

- Braun ('96 to 2000, 2001 and later accepted) (not ADA, but including Stow and Go Seats).

- El Dorado National (2013- later) 10” lowered floor.

Chrysler Corp. PT Cruiser – Not yet accepted for purchase.

Ford Freestar Vans – It has not yet been accepted for purchase.

Honda Odyssey minivans:

- VMI ('2007 and later accepted)

Toyota Sienna:

- IMS (2004-2006 accepted)

- Braun (2006 and later accepted)

Rear entry minivans – Not yet accepted for purchase.

Modifications to Vehicle Body and Structure (Non Unit Body Vehicles) (FMVSS 208) – SADE 5.3 Vehicles are exempted from compliance with the FMVSS if the

vehicle has been fitted with a lift, lowered floor/raised roof and hand control, if they have a Type 2 or Type 2A seat belt assembly.

NMEDA – 2004 – 2007 Not accepted as long as lowered floor manual is based on use of TDM modified vans which are no longer available. The manual is currently being modified to correct that.

Nor-Cal – Acceptance exempted with proper seat belts.

Modifications to Vehicle Body and Structure (Unit Body Vehicles) (FMVSS 208) – SADE 6.1.1

Minivans - See Minivans above.

Full sized vans (e.g. Daimler-Chrysler) – Not yet accepted for purchase.

Non-OEM Switches (FMVSS 101) – SADE 11.1 Non OEM switches must comply with the non exempted parts of FMVSS 101. These require the use of standard symbols and telltale (warning lights) colors and all cabin lighting forward of the driver to be able to be adjusted or turned off. That will be considered in the acceptance of controls which are on a manufactured device such as a powered hand control or remote steering. If there are questions about other switches added by vehicle modifiers especially for secondary controls, contact the Rehabilitation Engineer or have the vehicle modifier demonstrate the path to compliance for the switches.

Powered Hand Controls (FMVSS 124) –SADE 9.4.8 and 9.4.8.1

AEVIT by EMC (all combinations) – Accepted per SADE with 124 documentation.

Joysteer by Bozzio AG (all combinations) – accepted per SADE with 124 documentation.(May 16, 2013)

Air Touch by Creative Controls – Accepted per SADE 2-23-04

DSI by Driving Systems Inc. – Accepted per SADE (complies with 124).

Full size and minivan accepted

PGB by Independent Driving Systems – Not yet accepted.

PAC by Ahnfield – Not accepted (June 2007).

ACE by Ahnfield – Not accepted (June 2007).

Wells Engberg – Accepted per SADE.

Raised floors (or power pans) (no specific FMVSS) – 5.3.9 and 6.1.3 Raised floors are sometimes needed, for example in a mini van with a fixed floor lowering depth, where the normal floor lowering is too low for proper visibility. The raised floor structure (including wheelchair securements and safety belts) is subject to the same path to compliance requirements as the original floor modification.

No such modifications have yet been accepted. Contact the Rehabilitation Engineer for specific cases.

Raised Roofs Structural Support (no FMVSS) – SADE 5.2.4. Raised roof must comply with structure described in SADE 5.2.4 unless vehicle modifier can show compliance with NMEDA QAP Structural raised roof support manual which is also acceptable.

Raised Roofs (FMVSS 216) – 5.2.6 Vehicle modifiers must demonstrate the path to compliance for the raised roofs they or their subcontractors use on Department of Rehabilitation modifications.

Raised Roofs (FMVSS 201U) – This FMVSS applies to all multipurpose passenger vehicles with a GVWR under 10,000 pounds. This standard was recently included in the “Make Inoperative” exemptions for the portions of the standard which would be affected by a raised roof.

Reduced Effort Braking (FMVSS 105 & 135) – SADE 9.2.5 Vehicles manufactured after September 1, 2002 which weigh under 7116 pounds must meet FMVSS 135 and vehicles manufactured after September 1, 2002 which weigh over 7116 pounds must meet FMVSS 105. As a result, virtually all of the vehicles being modified for personal use must comply with FMVSS 135. Vehicle modifiers must demonstrate the path to compliance for changes to the braking system they use on Department of Rehabilitation modifications which could affect the performance of the brakes. (We only need documentation of compliance related to the specific parts of the system they have changed, not the whole standard.) It has been determined that, since reduced effort braking only changes the way in which the vacuum booster reacts to the driver’s force input to the brake pedal, the braking components which determine braking performance as tested in FMVSS 105 and FMVSS 135 have not been affected and do not require testing to show a path to compliance.

Remote Steering Systems (FMVSS 204) – SADE 9.1.7 Acceptance for purchase required. Exempted for compliance with FMVSS 204 by 49 CFR Part 595 Exemptions from the Make Inoperative Prohibition; Final Rule. We are aware of manufacturers of the following remote steering systems the systems indicated have been accepted for purchase:

- AEVIT by EMC (all combinations accepted)

- DriveMaster Horizontal Steering - accepted

- DSI by Driving Systems Inc for full sized Ford Vans and approved minivans accepted.

- Joysteer by Bozzio AG (all combinations) – accepted per SADE with 124 documentation.(May 16, 2013)

- IDS – accepted

Safety Belt Assemblies (FMVSS 209) – SADE 7.3, 8.3.6.2, 8.4.1, 8.4.2.2, 8.4.3.2.
– Vehicle modifiers must demonstrate the path to compliance for the safety belt assemblies they use on Department of Rehabilitation modifications. (Note: This does not apply to “chest harnesses” used for lateral support for wheelchair drivers or passengers.)

Rear Bench Seats or passenger seats which have been moved or added – SADE 7.3

Removed or replaced lap belts – SADE 8.4.1, 8.4.2.2.1.1

Removed or replaced upper torso belts – SADE, 8.4.1, 8.4.2.1.2, 8.4.2.1.3, 8.4.2.1.3,

Wheelchair seat belts – SADE 8.3.6.2, 8.4.1, 8.4.2.2

Safety Belt Anchorages (FMVSS 210) – SADE 7.3, 8.3.6.2, 8.4.1, 8.4.2.2, 8.4.2.2.4 8.4.3.2. Vehicle modifiers must demonstrate the path to compliance for the safety belt anchorages they use on Department of Rehabilitation modifications. This would include anchorages for:

Rear Bench Seats or passenger seats which have been moved or added – SADE 7.3

Removable Driver Seats – SADE 8.3.6.2

Removed or replaced lap belts – SADE 8.4.1, 8.4.2.2.1.1

Transfer seats (Since the safety belt receiver buckle is mounted on the OEM seat itself with the forces transferred to the floor through an OEM seat base which has been tested to absorb the load in an accident.) – SADE 7.1.2.5

Removed or replaced upper torso belts – SADE, 8.4.1, 8.4.2.1.2, 8.4.2.1.3,

Seat Anchorages (FMVSS 207) Vehicle modifiers must demonstrate the path to compliance for the seat anchorages they use on Department of Rehabilitation modifications. This would include anchorages for:

Rear Bench Seats which have been moved or added – SADE 7.3

Removable Driver’s Seats – SADE 8.3.6.2, 8.3.6.3

Transfer Seats – SADE 7.1.1

Secondary Control Consoles (FMVSS 101) – SADE 10.4.5 Vehicle modifiers must demonstrate the path to compliance for the secondary control consoles they use on Department of Rehabilitation modifications.

EMC – accepted for purchase

IDS – accepted for purchase

Crescent – accepted for purchase

Driving Systems incorporated - accepted for purchase

Steering Column Extensions (FMVSS 204) – 9.1.5 If these are considered to be a structural change to the steering shaft, they are exempted by 49 CFR Part 595 Exemptions from the Make Inoperative Prohibition; Final Rule.

Steering Modifications Affecting the Steering Column (FMVSS 203 and 204) – SADE 9.1 & 9.1.7 Exempted by 49 CFR Part 595 Exemptions from the Make Inoperative Prohibition; Final Rule. Documentation certifying compliance with FMVSS 203 and 204 has been received by the Rehabilitation Engineer for:
EMC (AEVIT steering systems)
Joysteer by Bozzio AG (steering systems)

Steering Devices (no FMVSS) – SADE 9.1.2.4 The steering devices from the following manufacturers or vehicle modifiers comply with the Specifications for Adaptive Driving Equipment. The following devices are known to comply:
Driving Systems Inc. (DSI) – Accepted July 31, 1989 per SADE for full sized Ford Vans,
Driving Systems Inc. (DSI) – Accepted July 27, 2007 for 2007 and later mini vans.

Wheelchair Securement (no FMVSS) – SADE 8.3.6 Vehicle modifiers must demonstrate the path to compliance with this specification for the wheelchair securement they use on Department of Rehabilitation modifications.

Wheelchair Lifts (FMVSS 403 and 404) – SADE 4.4.1 & 4.4.2 Vehicle modifiers must demonstrate the path to compliance for the wheelchair lifts they use on Department of Rehabilitation modifications. This will normally consist of certification by the manufacturer that they comply with FMVSS 403 (for lift manufacturers) and certification by the installer that they comply with FMVSS 404 (for lift installers). Until further notice, all wheelchair lifts which are compliant with FMVSS 403 and installed in compliance with FMVSS 402 are accepted for purchase. Note: At the end of this section on wheelchair lifts that there are still wheelchair lifts which will not be accepted for purchase even if they have a path to compliance with FMVSS 403.

Wheelchair lifts which were accepted for purchase per SADE prior to July 1, 2005 and, per National Highway Traffic Safety Administration are still acceptable for use in vehicles which are being modified after the first sale until these lifts are no longer available. – SADE 4.4.1 (Since these lifts are not known to be compliant with FMVSS 403, they cannot legally be produced for sale in the United States after April 1, 2005):

Braun Corporation
Platform Lifts

L400U to 402U Liftaway (Side) Automatic
L404U to 406U Liftaway (Side) Automatic
L40U to 42U Liftaway (Side) Passenger
L100U Liftaway (Rear) Automatic
L101U Liftaway (Rear) Automatic
L10U Liftaway (Rear) Passenger
L100-54 Liftaway (Rear) Passenger
L2050ARS Liftaway (Rear) Passenger
L127U Liftaway (Dodge Side) Automatic
Braun L955 Millennium
MV7688 Mini Vangator Automatic
V7684 Vangator
V9684 (Vangator II trifold)
UVL603A (accepted only per Rehabilitation Engineer review per SADE 4.4.10).

Rotary Lifts
(no longer accepted)

VMI/Ricon Corporation
Unilite
others

Wheelchair Lifts which were produced prior to July 1, 2005 but were specifically not accepted for purchase and are still not acceptable are:

Lifts on vans intended for independent operation by a driver which have no power roll stop and/or an automatic stop cannot be installed on them.

Lifts known to be "not accepted for purchase" on this basis are:

Braun Vista Lift (platform folds in half longitudinally)
Crow River Model 7684
Ricon S1000
Ricon S1231

Lifts with the platform side barrier cut out, unless the cutout portion is a powered roll stop which comes up when the platform raises or the side barrier is welded or permanently attached (not bolted) in place.

Wheelchair Lifts which are specifically not accepted prior to or after July 1, 2005, even if they are compliant with FMVSS 403:

Wheelchair Lifts which place stresses on the wheelchair other than those designed by the wheelchair manufacturer. (SADE 4.4.4) Lifts known to be "not accepted for purchase" on this basis are:

Superarm Lift

Wheelchair Lifts which require suspension changes (SADE 4.4.6). The installation of such lifts in vehicles when no suspension modification is needed (e.g. Ford 250/E350) require individual approval by the Rehabilitation Engineer of the Department of Rehabilitation. These include:

- Braun UVL603A on Ford E150s

- Ricon Mirage

- Ricon Commercial KlearVue

Appendix 1 Federal Motor Vehicle Safety Standards

For years, the National Highway Transportation Safety Administration (NHTSA) has set forth Federal Motor Vehicle Safety Standards (FMVSS) which regulate the safety of the vehicles produced by Original Equipment Manufacturers (OEM) such as Ford and Chevrolet. The industry of modifying vehicles for drivers with disabilities had, however, long been considered an “aftermarket” industry (such as trailer hitches, fancy wheels or high performance items). Several years ago, however, it was noted that a part of Federal law (49 US Code Sec. 30122) requires that no one should “make inoperative” any device installed in an OEM vehicle order for that vehicle to comply with a Federal Motor Vehicle Safety Standard. It is, however, common to make such devices inoperative when modifying vehicles for drivers with disabilities. For example, the installation of most hand controls necessitates the modification or removal of the knee bolster (the plastic panel under the steering column and dashboard), which was installed as a safety device. NHTSA, not wanting to virtually eliminate the modification of vehicles for drivers with disabilities, in February 27, 2001, published 49 CFR Part 595, “Exemptions from the Make Inoperative Prohibition; Final Rule” in the Federal Register. The effective date was April 30, 2001.

This “Final Rule”, along with an explanation of the rule, makes specific portions of the Federal Motor Vehicle Safety Standards exempt for certain classes of modifiers who make modifications to vehicles for drivers with disabilities. Compliance is, however, required and expected on all standards (or sections of standards) not exempted.

Department of Rehabilitation contracts with vehicle modifiers since 2001 have included a general requirement for compliance with this 49 CFR Part 595. Since the 2004 revision, the Specifications for Adaptive Driving Equipment incorporates more specific directions as to how compliance with those standards must and can be achieved.

Appendix 2 PATH TO COMPLIANCE

Before a vehicle is signed off by the Designated Inspector, the vehicle modifier must sign a part of a form presented by the Inspector which states that, to the best of his/her knowledge, all work on the vehicle complies with the Specifications for Adaptive Driving Equipment (SADE), all applicable Federal Motor Vehicle Safety Standards, all manufacturer's installation guidelines and follows NMEDA QAP Guidelines (if the vehicle modifier is NMEDA QAP certified). (SADE 13.3)

In addition to this form, the vehicle modifier must be prepared to demonstrate the path to compliance for the specific products listed at the end of this Appendix. Many products installed on a vehicle do not require a path to compliance. Some are simply installed then inspected for installation per the SADE or the inspector's judgment. Some components are required by the SADE to be accepted for purchase prior to being bid or installed. Acceptance for purchase is a process of data collection and review by the Rehabilitation Engineer and Fleet Administration. (see SADE 1.2.1) All products which must be accepted for purchase are indicated earlier in this document. Many products installed on vehicles modified for consumers of the Department of Rehabilitation are not required to be specifically accepted for purchase but must meet other standards (such as Federal Motor Vehicle Safety Standards) in order to comply with the Specifications for Adaptive Driving Equipment. For those products the vehicle modifier must be prepared to delineate the "path to compliance" to the Fleet Administration Inspector via documentation and demonstration.

The words "path to compliance" simply means the manner in which it can be demonstrated that a product achieves compliance with a specific standard. It may be documentation of the test of a design produced by the vehicle modifier, or a certification that a manufacturer has tested the product and it has achieved compliance. For example, one path to compliance for FMVSS 301 (Fuel System Integrity) for an aft-of-axle fuel system could be for the vehicle modifier to install a fuel system of his/her own design and fabrication and have that system tested. Demonstrating a path to compliance would involve producing documentation showing the system passed the necessary tests and producing documentation showing that the fuel system in the vehicle being inspected was designed and installed in the same manner and complies with other parts of the SADE. Alternatively, the vehicle modifier could purchase a fuel system which had been tested by its manufacturer and install the fuel system per the manufacturer's and the OEM's instructions. In this case, the vehicle modifier would produce the certification of compliance from the manufacturer and furnish the installation manual so the Fleet Administration Inspector can determine that the fuel system

was installed per the manufacturer's instructions. Another method would be to purchase (or have the consumer purchase) a vehicle from a second stage manufacturer with the aft-of-axle fuel system installed. Documentation that the vehicle modified corresponds to one of the vehicles (e.g. lowered floor mini vans) accepted for purchase earlier in this document would demonstrate the path to compliance. The vehicle modifier could also demonstrate that the fuel system had been installed per National Mobility Equipment Dealers Association (NMEDA) specifications (including the NMEDA specified tank, installed in a vehicle modified per the NMEDA QAP Structural documents) since NMEDA has tested an installed fuel system and documented the installation specifications. Because of their complexity, fuel system compliance is accepted by the Rehabilitation Engineer and the Fleet Administration Inspector need only determine that one of the accepted systems was used.

The following items require a path to compliance to be furnished by the vehicle modifier to the Designated Inspector at the time of inspection:

- Carpeting (FMVSS 302)
- Door latch (FMVSS 206)
- Insulation And Paneling (FMVSS 302)
- Non-OEM Switches (FMVSS 101)
- Raised roofs (FMVSS 216)
- Safety Belt Assemblies (FMVSS 209)
- Safety Belt Anchorages (FMVSS 210)
- Seat Anchorages (FMVSS 207)
- Secondary Control Consoles (FMVSS 101)
- Steering Modifications Affecting the Steering Column (FMVSS 203 and 204)
- Wheelchair Securement (SADE 8.3.6)
- Wheelchair Lifts (FMVSS 403 and 406)

Feel free to call the Rehabilitation Engineer at 323-562-1323 or email him (gregory.j.paquin@dor.ca.gov) with any questions about a path to compliance being presented.